

 Substitute Form PTO-1449 (Modified) Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR 1.98(b))	U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. 14174-070US1	Application No. 10/553,659
	Applicant Muthiah Manoharan		
	Filing Date April 14, 2006	Group Art Unit 1635	

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
/T.V./	AA	4,415,732	11/15/1983	Caruthers et al.			
↓	AB	4,458,066	07/03/1984	Caruthers et al.			
	AC	4,897,355	01/30/1990	Eppstein et al.			
	AD	5,171,678	12/15/1992	Behr et al.			
	AE	5,328,470	07/12/1994	Nabel et al.			
	AF	5,691,316	11/25/1997	Agrawal et al.			
	AG	5,889,136	03/30/1999	Scaringe et al.			
	AH	6,107,094	08/22/2000	Crooke			
	AI	2003/0008818	01/09/2003	Pun et al.			
↓	AJ	6,509,323	01/21/2003	Davis et al.			

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
/T.V./	AK	WO 96/41809	12/27/1996	WIPO				
↓	AL	WO 91/16024	10/31/1991	WIPO				
	AM	WO 93/24640	12/09/1993	WIPO				
	AN	WO 94/00569	01/06/1994	WIPO				
	AO	WO 96/37194	11/28/1996	WIPO				
	AP	WO 98/39359	09/11/1998	WIPO				
	AQ	WO 00/44895	08/03/2000	WIPO (with English abstract)				
	AR	WO 00/44914	08/03/2000	WIPO				
	AS	WO 01/36646	05/25/2001	WIPO				
	AT	WO 01/75164	10/11/2001	WIPO				
	AU	WO 02/44321	06/06/2002	WIPO				
↓	AV	WO 2004/080406	09/23/2004	WIPO				

Other Documents (include Author, Title, Date, and Place of Publication)

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/T.V./	AW	Amosova et al., "Effect of the 1-(2'-deoxy- β -D-ribofuranosyl)-3-nitropyrrole residue on the stability of DNA duplexes and triplexes", <i>Nucleic Acids Research</i> , vol. 25(10):1930-1934 (1997).
	AX	Aoki et al., "Potential tumor-targeting peptide vector of histidylated oligolysine conjugated to a tumor-homing RGD motif", <i>Cancer Gene Therapy</i> , vol. 8(10):783-787 (2001).
	AY	Ausin et al., "Synthesis of Amino- and Guanidino-G-Clamp PNA Monomers", <i>Organic Letters</i> , vol. 4(23):4073-4075 (2002).
	AZ	Berger et al., "Universal bases for hybridization, replication and chain termination", <i>Nucleic Acids Research</i> , vol. 28(15):2911-2914 (2000).
	AAA	Bergstrom et al., "Synthesis, Structure, and Deoxyribonucleic Acid Sequencing with a Universal Nucleoside: 1-(2'-Deoxy- β -D-ribofuranosyl)-3-nitropyrrole", <i>J. Am. Chem. Soc.</i> , vol. 117:1201-1209 (1995).
	ABB	Brotschi et al., "A Stable DNA Duplex Containing a Non-Hydrogen-Bonding and Non-Shape-Complementary Base Couple: Interstrand Stacking as the Stability Determining Factor", <i>Angew. Chem. Int. Ed.</i> 40(16):3012-3014, 2001.
	ACC	Chaloin et al., "Design of Carrier Peptide-Oligonucleotide Conjugates with Rapid Membrane Translocation and Nuclear Localization Properties", <i>Biochem. And Biophys. Res. Comm.</i> , vol. 243:601-608 (1998).
	ADD	Chen et al., "Determination of stereochemistry stability coefficients of amino acid side-chains in an amphipathic α -helix", <i>J. Peptide Res.</i> , vol. 59:18-33 (2002).
	AEE	Chen et al., "Gene therapy for brain tumors: Regression of experimental gliomas by adenovirus-mediated gene transfer in vivo", <i>Proc. Natl. Acad. Sci. USA</i> , vol. 91:3054-3057 (1994).
	AFF	Chui et al., "Synthesis of Helix 69 of Escherichia coli 23S rRNA Containing Its Natural Modified Nucleosides, $M^3\psi$ and ψ ", <i>J. Org. Chem.</i> , vol. 67:8847-8854 (2002).
	AGG	Chui et al., "Synthesis of a 3-Methyluridine Phosphoramidite to Investigate the Role of Methylation in a Ribosomal RNA Hairpin", <i>Bioorg. & Med. Chem.</i> , vol. 10:325-332 (2002).
	AHH	Colledge et al., "Disruption of c-mos causes parthenogenetic development of unfertilized mouse eggs", <i>Nature</i> , vol. 370:65-68 (1994).
	AII	Cormier et al., "Synthesis of hexanucleotide analogues containing diisopropylisilyl internucleotide linkages", <i>Nucleic Acids Research</i> , vol. 16(10):4583-4594 (1988).
	AJJ	Cornut et al., "Application to the de novo design of ideally amphipathic Leu, Lys peptides with hemolytic activity higher than that of melittin", <i>FEBS Letters</i> , vol. 349:29-33 (1994).
	AKK	Crimmins et al., "New Developments in the Enantioselective Synthesis of Cyclopentyl Carbocyclic Nucleosides", <i>Tetrahedron</i> , vol. 54:9229-9272 (1998).
	ALL	Decrossi et al., "The Third Helix of the Antennapedia Homeodomain Translocates through Biological Membranes", <i>J. Biol. Chem.</i> , vol. 269(14):10444-10450 (1994).
	AMM	Edge et al., "Synthetic Analogues of Polynucleotides. Part VIII. Analogues of Oligonucleotides containing Carboxymethylthymidine", <i>J.C.S. Perkin I</i> , pp. 1991-1996, February 1972.
	ANN	Elbashir et al., "Functional anatomy of siRNAs for mediating efficient RNAi in Drosophila melanogaster embryo lysate", <i>The EMBO Journal</i> , vol. 20(23):6877-6888 (2001).
	AOO	Elmqvist et al., "VE-Cadherin-Derived Cell-Penetrating Peptide, pVEC, with Carrier Functions", <i>Experimental Cell Research</i> , vol. 269:237-244 (2001).
↓	APP	Evans et al., "Synthesis of Transition State Analogue Inhibitors for Purine Nucleoside Phosphorylase and N-Riboside Hydrolases", <i>Tetrahedron</i> , vol. 56:3053-3062 (2000).

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Other Documents (include Author, Title, Date, and Place of Publication)

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/T.V./	AQQ	Feldner et al., "Enhanced Gene Delivery and Mechanism Studies with a Novel Series of Cationic Lipid Formulations", J. Biol. Chem., vol. 269(4):2550-2561 (1994).
	ARR	Felgner et al., "Lipofection: A Highly Efficient, Lipid-Mediated DNA-Transfection Procedure", Proc. Of the Nat'l. Acad. Of Sci USA, vol. 84:7413-7417 (1987).
	ASS	Filichev et al., "Synthesis of 1'-aza-C-nucleosides from (3R,4R)-4-(hydroxymethyl)pyrrolidin-3-ol", Tetrahedron, vol. 57:9163-9168 (2001).
	ATT	Flanagan et al., "A cytosine analog that confers enhanced potency to antisense oligonucleotides", Proc. Of the Nat'l. Acad. Of Sci USA, vol. 96:3513-3518 (1999).
	AUU	Fukunaga et al., "Liposome Entrapment Enhances the Hypocalcemic Action of Parenterally Administered Calcitonin", Encorinology, vol. 115(2):757-761 (1984).
	AVV	Gante, J., "Azapeptides", Synthesis, pp. 405-413, June 1989.
	AWW	Gao et al., "A Novel Cationic Liposome Reagent for Efficient Transfection of Mammalian Cells", Biochem. And Biophys. Res. Comm., vol. 179(1):280-285 (1991).
	AXX	Gershon et al., "Mode of Formation and Structural Features of DNA-Cationic Liposome Complexes Used for Transfection", Biochem., vol. 32:7143-7151 (1993).
	AYY	Grell et al., "protein Design and Folding: Template Trapping of Self-assembled Helical Bundles", J. Peptide Science, vol. 7:146-151 (2001).
	AZZ	Guckian et al., "Structure and base Pairing Properties of a Replicable Nonpolar Isotere for Deoxyadenosine", J. Org. Chem., vol. 63:9652-9656 (1998).
	AAAA	Hammond et al., "Argonaute2, a Link Between Genetic and Biochemical Analyses of RNAi", Science, vol. 293:1146 (2001).
	ABBB	Hasimoto et al., "Parthenogenetic activation of oocytes in c-mos-deficient mice", Letters to Nature, vol. 370:68 (1994).
	ACCC	Haubner et al., "Glycosylated RGD-Containing Peptides: Tracer for Tumor Targeting and Angiogenesis Imaging with Improved Biokinetics", J. Nuc. Med., vol. 42(2):326 (2001).
	ADDD	Hayakawa et al., "The Allylic Protection Method in Solid-Phase Oligonucleotide Synthesis. An Efficient Preparation of Solid-Anchored DNA Oligomers", J. Amer. Chem. Soc., vol. 112:1691-1696 (1990).
	AEEE	Hernandez et al., "Solid-Supported tert-Alkoxyacylation Reagents for Anchoring of Amines during Solid Phase Organic Synthesis", J. Org. Chem., vol. 62:3153-3157 (1997).
	AFFF	Holmes et al., "Steric inhibition of human immunodeficiency virus type-1 Tat-dependent trans-activation in vitro and in cells by oligonucleotides containing 2'-O-methyl G-clamp ribonucleotide analogues", Nuc. Acids Res., vol. 31(11):2579-2768, 2003.
	AGGG	Holmes et al., "The Synthesis of 2'-O-Methyl G-Clamp Containing Oligonucleotides and Their Inhibition of the HIV-1 Tat-TAR Interaction", Nucleosides, Nucleotides & Nucleic Acids, vol. 22(5-8):1262 (2003).
	AHHH	Iwata et al., "Design and Synthesis of Amphipathic 3 ₁₀ -Helical Peptides and Their Interactions with Phospholipid Bilayers and Ion Channel Formation", J. Biol. Chem., vol. 269(7):4928-4933 (1994).
	AIII	Kawasaki et al., "Uniformly Modified 2'-Deoxy-2'-fluoro Phosphorothioate Oligonucleotides as Nuclease-resistant Antisense Compounds with High Affinity and Specificity for RNA Targets", J. Med. Chem., vol. 36:831-841 (1993).
↓	AJJJ	Ketting et al., "Dicer functions in RNA interference and in synthesis of small RNA involved in developmental timing in C. elegans", Genes & Dev., vol. 15:2654-2659 (2001).

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/T.V./	AKKK	Kim et al., "Preparation of Multivesicular Liposomes", Biochimica et Biophysica Acta, vol. 728:339-348 (1983).
	ALLL	Kutyavin et al., "Oligonucleotides Containing 2-Amino-adenine and 2-Thiothymine Act as Selectively Binding Complementary Agents", Biochemistry, vol. 35:11170-11176 (1996).
	AMMM	Lam et al., "A new type of synthetic peptide library for identifying ligand-binding activity", Nature, vol. 354:82 (1991) Lan et al., "Minor Groove Hydration is Critical to the Stability of DNA Duplexes", J. Am. Chem. Soc., vol. 122:6512-6513 (2000).
	ANNN	Tae et al., "Efforts toward Expansion of Genetic Alphabet: Replication of DNA with Three Base Pairs", J. Am. Chem. Soc., vol. 123:7439-7440 (2001).
	AOOO	Limbach et al., "Summary: the modified nucleosides of RNA", Nuc. Acids Res., vol. 22(12):2183-2196 (1994).
	APPP	Liu et al., "Bi-stranded, multisite replication of a base pair between difluorotoluene and adenine: confirmation by 'inverse' sequencing", Chemistry & Biology, vol. 4:919-926 (1997).
	AQQQ	Loakes et al., "The applications of universal DNA base analogues", Nuc. Acids Res., vol. 29(12):2437-2447 (2001).
	ARRR	Lohse et al., "Double duplex invasion by peptide nucleic acid: A general principle for sequence-specific targeting of double-stranded DNA", Proc. Nat'l. Acad. Sci., USA, vol. 96(21):11804-11808 (1999).
	ASSS	Maier et al., "Nuclease Resistance of Oligonucleotides Containing the Tricyclic Cytosine Analogues Phenoxazine and 9-(2-Aminoethoxy)-Phenoxazine ("G-clamp") and Origins of their Nuclease Resistance Properties", Biochem., vol. 41:1323-1327 (2002).
	ATTT	Manoharan, M., "Oligonucleotide Conjugates as Potential Antisense Drugs with Improved Uptake, Biodistribution, Targeted Delivery, and Mechanism of Action", Antisense & Nucleic Acid Drug Dev., vol. 12:103-128 (2002).
	AUUU	Martin et al., "Stereoselective Synthesis of 2'-O-(2-Methoxyethyl)ribonucleosides: Neighboring-group participation of the Methoxyethoxy Group in the Ribosylation Step", Helvetica Chimica Acta, vol. 79:12930 (1996).
	AVVV	Matray et al., "Selective and Stable DNA Base Pairing without Hydrogen Bonds", J. Am. Chem. Soc., vol. 120:6191-6192, 1998.
	AWWW	Mayer et al. "Vesicles of variable sizes produced by a rapid extrusion procedure". Biochimica et Biophysica Acta 858:161-168, 1986.
	AXXX	Mayhew et al. "Characterization of liposomes prepared using a microemulsifier". Biochimica et Biophysica Acta 775:169-174, 1984.
	AYYY	Morales et al. "Importance of terminal base pair hydrogen-bonding in 3'-end proofreading by the klenow fragment of DNA polymerase I". Biochemistry 39:2626-2632, 2000.
	AZZZ	Moran et al. "Difluorotoluene, a nonpolar isostere for Thymine, codes specifically and efficiently for adenine in DNA replication". J. Am. Chem. Soc. 119:2056-2057, 1997.
	AAAAA	McMinn et al. "Efforts toward expansion of the genetic alphabet: DNA polymerase recognition of a highly stable, self-pairing hydrophobic base". J. Am. Chem. Soc. 121:11585-11586, 1999.
	ABBBB	Mi et al. "Characterization of a class of cationic peptides able to facilitate efficient protein transduction in vitro and in vivo". Molecular Therapy 2(4):339, October 2000.
↓	ACCCC	Mitchell et al. "Polyarginine enters cells more efficiently than other polycationic homopolymers". J. Peptide Res. 56:318-325, 2000.

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T.V./	ADDDD	Nabel et al. "Direct Gene Transfer with DNA-liposome complexes in melanoma: expression, biologic activity, and lack of toxicity in humans". PNAS 90:11307-11311, 1993.
	AEEEE	Nabel et al. "Gene Transfer in vivo with DNA-liposome complexes: lack of autoimmunity and gonadal localization". Human Gene Therapy 3:649-656, 1992.
	AFFFF	Nakatani et al. "Recognition of a single quinine bulge by 2-acylamino-1,8-naphthryridine". J. Am. Chem. Soc. 122:2172-2177, 2000.
	AGGGG	Nakatani et al. "Specific binding of 2-amino-1,8naphthryridine into a single guanine bulge as evidenced by photooxidation of GG doublet". Bioorganic & Medicinal Chemistry Letters 11:335-337, 2001.
	AHHHH	Negrete et al. "Deciphering the structural code for proteins: helical propensities in domain classes and statistical multiresidue information in {alpha}-helices". Protein Sci. 7:1368-1379, 1998.
	AIIII	Nykanen et al. "ATP requirements and small interfering RNA structure in the RNA interference pathway". Cell 107:309-321, November 2001.
	AJJJJ	Ogawa et al. "Efforts toward the expansion of the genetic alphabet: information storage and replication with unnatural hydrophobic base pairs". J. Am. Chem. Soc. 122:3274-3287, 2000.
	AKKKK	Ogawa et al. "Rational design of an unnatural base pair with increased kinetic selectivity". J. Am. Chem. Soc. 122:8803-8804, 2000.
	ALLLL	Oliver et al. "Effect of the universal base 3-nitropyrrole on the selectivity of neighboring natural bases". Organic Letters 3(13): 1977-1980, 2001.
	AMMMM	Olson et al. "Preparation of liposomes of defined size distribution by extrusion through polycarbonate membranes". Biochimica et Biophysica Acta 557:9-12, 1979.
	ANNNN	Oppoizer et al. "193. 3-Triethylsilyloxypentadienyllithium, a versatile 1,3-diene- or vinyl ketone-building block". Helvetic Chimica Acta 64(7): 2002-2021, Nbr. 193, 1981.
	AOOOO	Pirung et al. "A Universal, photocleavable DNA case: nitropiperonyl 2'-deoxyribose". J. Org. Chem. 66:2067-2071, 2001.
	APPPP	Pooga et al. "Cellpenetration by transportan". FASEB J. 12:67-77, 1998.
	AQQQQ	Prakash et al. "Synthesis of 2'-O-[2-[(N,N-Dimethylamino)oxy]ethyl] modified nucleosides and oligonucleotides". J. Org. Chem. 67:357-369, 2002.
	ARRRR	Rajappan et al. "An 8-aminoimidazo[4,5-g]guiazoline carbocyclic nucleoside: a ring-extended analog of 5'-noraristeromycin". Tetrahedron 57:9049-9053, 2001.
	ASSSS	Rajeev et al. "High-affinity peptide nucleic acid oligomers containing tricyclic cytosine analogues". Organic Letters 4(25):4395-4398, 2002.
	ATTTT	Roush et al. "trichothecene degradation studies. 2. Synthesis of [13- ¹⁴ C] anguidine". J. Org. Chem. 52:598-603, 1987.
	AUUUU	Simeoni et al. "Insight into the mechanism of the peptide-based gene delivery system MPG: implications for delivery of siRNA into mammalian cells". Nucleic Acids Research 31(11):2717-2724, 2003.
	AVVVV	Strauss et al. "Molecular complementation of a collagen mutation in mammalian cells using yeast artificial chromosomes". The EMBO Journal 11(2):417-422, 1992.
↓	AWWWW	Stirchak et al. "Uncharged stereoregular nucleic acid analogs: 2. Morpholino nucleoside oligomers with carbamate internucleoside linkages". Nucleic Acid Research 17(15):6129-6141, 1989.

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/T.V./	AXXXX	Szoka et al. "Procedure for preparation of liposomes with large internal aqueous space and high capture by reverse-phase evaporation". Proc. Natl. Acad. Sci. USA 75(9):4194-4198, September 1978.
	AYYYY	Tona et al. "Synthesis of aminoglucoside-modified oligonucleotides". Organic Letters 2(12):1693-1696, 2000.
	AZZZZ	Verma et al. "Modified oligonucleotides". Annu. Rev. Biochem. 67:99-134, 1998.
	AAAAA	Vives et al. "A truncated HIV-1 tat protein basic domain rapidly translocates through the plasma membrane and accumulates in the cell nucleus". Journal of Biological Chemistry 272(25):16010-16017, 1997.
	ABBBB	Weizman et al. "2,2'-bipyridine ligandosome: a novel building block for modifying DNA with intra-duplex metal complexes". J. Am. Chem. Soc. 123:3375-3376, 2001.
	ACCCCC	Wengel. "Synthesis of 3'-C- and 4'-C-branched oligodeoxynucleotides and the development of locked nucleic acid (LNA)". Acc. Chem. Res. 32:301-310, 1999.
	ADDDDD	Wilds et al. "Structural basis for recognition of guanosine by a synthetic tricyclic cytosine analogue: guanidinium g-clamp". Helvetica Chimica Acta 86:966-978, 2003.
	AEEEEEE	Wu et al. "Efforts toward expansion of the genetic alphabet: optimization of interbase hydrophobic interactions". J. Am. Chem. Soc. 122(32):7621-7632, August 16, 2000.
	AFFFFF	Zhou et al. "Lipophilic polylysines mediate efficient DNA transfection in mammalian cells". Biochimica et Biophysica Acta 1065:8-14, 1991.
	AGGGGG	Zhou et al. "Targeted delivery of DNA by liposomes and polymers". Journal of Controlled Release 19:269-274, 1992.
	AHHHHH	Zimmerman et al. "Model studies directed toward a general triplex DNA recognition scheme: a novel DNA base that binds a CG base-pair in an organic solvent". J. Am. Chem. Soc. 117:10769-10770, 1995.
↓	AIIIII	Zitzmann et al. "Arginine-glycine-aspartic acid (RGD)-peptide binds to both tumor and tumor-endothelial cells in vivo". Cancer Research 62:5139-5143, September 15, 2002.

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